CLAIMS

What is claimed is:

1. A trip system for a circuit breaker, comprising:

a current sensor having a contact surface, a first end that is supported and a second end with a degree of freedom, the current sensor arranged for receiving an electric current and for generating a displacement at the second end in response thereto; and

a stop surface disposed at a first distance from the first end and at a second distance from the contact surface, the stop surface being disposed closer to the first end than to the second end;

wherein the current sensor undergoes a first deflection in response to a first current and a second deflection in response to a second current, the first deflection resulting in clearance between the contact surface and the stop surface, and the second deflection resulting in contact between the contact surface and the stop surface.

2. The system of Claim 1, further comprising:

a terminal connected to the current sensor at the first end and disposed proximate the current sensor for at least a portion of the length of the current sensor, the terminal being disposed such that the current sensor deflects away from the terminal in response to an electric current.

3. The system of Claim 2, further comprising:

a calibration screw axially disposed perpendicular to the terminal at a third distance from the first end, the third distance being equal to or less than the first distance.

4. The system of Claim 2, further comprising:

a magnetic yoke defining a flux path proximate the current sensor, the magnetic yoke disposed in fixed relation to the current sensor and arranged for concentrating a magnetic flux associated with an electric current at the current sensor, the stop surface being supported by the magnetic yoke.

5. The system of Claim 4, wherein:

the magnetic yoke is connected to the terminal.

6. The system of Claim 4, wherein:

the stop surface is a pin made of steel.

7. The system of Claim 1, wherein:

the second deflection results in a mechanical stress level at the current sensor that is less than the mechanical yield point stress of the current sensor material.

8. The system of Claim 2, wherein:

the second deflection results in a mechanical stress level at the first end that is less than the mechanical yield point stress of the current sensor material and less than the mechanical yield point stress of the terminal material.

9. The system of Claim 1, wherein:

the current sensor is a bimetal.

10. A method for controlling the mechanical stress at a current sensor assembly of a circuit breaker, comprising:

restraining one end of a current sensor of the current sensor assembly;

energizing the current sensor;

permitting free deflection of the unrestrained portion of the energized current sensor; and

preventing free deflection of the unrestrained portion of the energized current sensor prior to the mechanical stress level at the current sensor reaching the mechanical yield point stress of the current sensor material.

11. The method of Claim 10, wherein the current sensor assembly further comprises a terminal connected to the current sensor at the restrained one end, and further comprising:

preventing free deflection of the unrestrained portion of the energized current sensor prior to the mechanical stress level at the terminal reaching the mechanical yield point stress of the terminal material.

12. The method of Claim 10, wherein the current sensor is a bimetal.

13. The method of Claim 10, wherein the energizing the current sensor, comprises:

electrically energizing the current sensor, thermally energizing the current sensor, magnetically energizing the current sensor, or any combination comprising at least one of the foregoing.

14. The method of Claim 10, wherein the preventing free deflection of the unrestrained portion of the energized current sensor further comprises:

preventing free deflection of the current sensor at a point on the current sensor that is closer to the restrained end than to the unrestrained end of the current sensor.

15. The method of Claim 14, further comprising:

applying to the current sensor a calibration force; and

preventing free deflection of the current sensor at a point on the current sensor that is further away from the restrained end than is the applied point of the calibration force.